

NESTED CONCEPTS: IMPLEMENTING COMMANDER'S VISION AND SECURING UNITY OF EFFORT

**A MONOGRAPH
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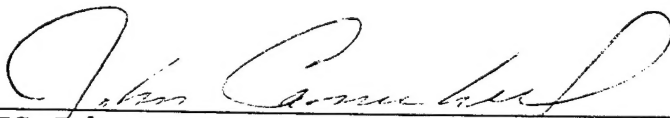
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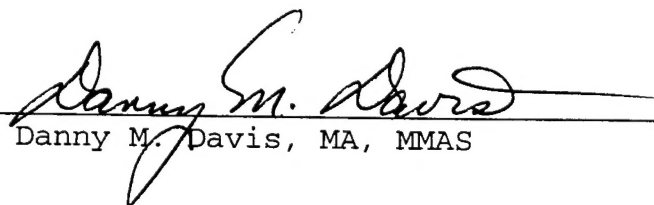
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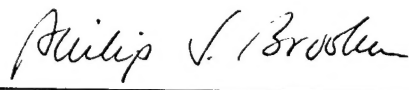
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ABSTRACT

NESTED CONCEPTS: IMPLEMENTING COMMANDER'S VISION AND
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This monograph argues that the idea of nested concepts is an inviolate principle which will be even more critical on the future battlefield. The primary research question is: will the future battlefield's environment still require nested concepts to enable subordinates at all levels to make sound, timely decisions?

This monograph examines past trends in weapons and information technology. These trends are applied to the future to envision the future battlefield environment. Tempo will continue to increase and soldiers will have to make decisions in a time-compressed environment. With smaller and more isolated units, it will be imperative for soldiers to analyze situations, use judgment and take initiative.

Even though Force XXI technology will improve situational awareness, a commander's vision is still required to provide the common goal and framework for the organization. Shared vision allows subordinates to exploit opportunities.

Nested concepts is a vehicle to communicate the vision throughout an organization. By insuring that the assigned purposes in the concept of operations support the commander's intent, nested concepts secures unity of effort. Nested concepts controls a subordinate's relationship both vertically with his commander and horizontally with his fellow commanders. But it does not control his actions. Implementing the commander's vision through nested concepts will enable subordinates to use their judgment and take the initiative when required to accomplish the common goal.

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I. Introduction

In its simplest form, doctrine is a blueprint for how an army organizes, equips, trains and fights. The coordinating draft of FM 100-5, which establishes the Army's operational doctrine, states that the manual "reflects the lessons of nearly a decade of post-cold war experience, assessments of technological advantages, sound theory, and an appreciation of proven fundamentals and principles."¹ Doctrine is an essential product in an army's attempt to foresee and prepare for the future. Doctrine must remain balanced between the lessons and trends of history and the world environment, missions and technology of the future. In this manner, doctrine establishes the azimuth for organizational changes, training requirements and integration of technology in the modernization process.

Recognizing that new technology might require an army to alter its command and control (C^2) system, it is important to understand that C^2 should not be configured to maximize the technology. Rather the technology should be incorporated as a tool to further enhance a C^2 system. The commander makes changes to the C^2 system to take advantage of the new capability. The bottom line is that the incorporation of the technology must lead to a C^2 system which enables the commander to employ his forces to attain mission success.²

But along with these changes must come an appreciation that some principles of command and control must not change. One of these, nested concepts, is the subject of this monograph.³ The intent of this monograph is to

argue that the idea of nested concepts is indeed an inviolate principle which will be even more critical on the future battlefield. The primary research question to be answered is: will the future battlefield's environment require nested concepts to enable subordinates at all levels to make sound, timely decisions?

This monograph will ask three subordinate questions in support of the primary research question. First, what will be the characteristics of the future battlefield? In order to envision the future battlefield, it is important to understand past trends in warfare, for in several ways, these trends hold the key to understanding the dynamics of change for the future. Although social, political and economic influences have played major roles in the evolution of warfare (a good example is French nationalism and the *Levee en Masse* with regard to Napoleon's Corps-based system), this paper will address mainly technological developments and their effects on commanders, units and soldiers. This will aid in focusing the argument for the monograph. In addition, current and proposed doctrine will be examined as well as future technological capabilities, specifically with respect to weapons and information technology. These will serve as an azimuth pointing towards the future battlefield environment.

Second, what are the major purposes and characteristics of the Force XXI initiative? This question will discuss the advantages Force XXI can provide, but more importantly, the limitations still inherent in this program. Training and Doctrine Command (TRADOC) Pamphlet 525-5, Force XXI Operations, is the Army's initial vision for future military operations. A major portion of the

pamphlet concerns the employment and integration of technology to support the Army's conduct of war in the early twenty-first century. According to the pamphlet, this new technology will yield situational awareness, digital control, a common view, etc., leading to a shared vision for battlefield leaders at all levels. These attributes lead to shared knowledge, allowing commanders to make decisions and take action faster than the enemy can react.⁴ In this way, leaders can 'see' the entire battlefield and therefore preempt the enemy's attempts to effect our operations. These assertions will be examined for validity and limitations of the Force XXI initiative, if found, will be cited.

Third, what is meant by nested concepts and why is this idea so important? This section will define nested concepts and its importance in imparting the commander's vision. Its role in securing unity of effort by linking the purposes in the commander's intent and the concept of operations will be discussed.

The intended audience for this research is a broad collection. Leaders at all levels need to understand the importance of nested concepts, both in their responsibility in providing a vision to their subordinates as well as understanding their role in their commander's plan. In addition, doctrine writers should reflect on the message presented in this monograph; Commanders command units but their subordinates lead the way to victory.

This monograph is limited in that it will not examine the social, political and economic influences on warfare. In looking at past trends, this monograph will not look for specific cause and effect between specific weapons or

communications technology; rather, it will look for general trends which emerge from discussing the general technological improvements. Finally, no attempt will be made to examine specific systems within the Force XXI initiative. A holistic approach will be taken; the intent is to understand the capabilities of the entire system as opposed to dissecting the program into its individual parts.

II. Weapons Technology

Envisioning what the future battlefield will look like is, at best, a conjecture. This monograph will approach this challenge by looking for past trends in the evolution of warfare. We will examine these trends in weapons and information technology, their causes and what these trends mean for the future. Information technology, for the purpose of this monograph, includes communications systems also.

Technology, in its pure form, does very little for armies on the battlefield. Armies must integrate the technology to serve their basic function - the defeat of the enemy. Only through the proper application of the technology within the military setting can improvements in military capabilities be achieved. This is the context in which we will examine the past.

Two types of weaponry have been employed by ground forces in history: strike and missile weapons. Strike weapons depend on shock effect and remain with the fighter as he physically approaches and attacks his opponent. Missile weapons either hurl some type of projectile or are themselves hurled at an opponent.⁵

When the Romans ruled in the Mediterranean world, their legions fought in massed formations of heavy infantry. They used javelins and swords to strike, heavy armor and shields to protect and their legs to maneuver against the enemy. In Greece the same applied, except the phalanxes relied on the spear or pike to strike. Auxiliary units supported the infantry, using bows, slings or darts to kill and disrupt the formations at a longer distance. Light and heavy cavalry were used for mobility as well as for providing shock effect. With the development of the saddle and horseshoe among other things, the cavalry gained preeminence over the infantry.⁶ They combined speed and shock effect with their maneuverability providing much of their protection.

The battles often turned into thousands of individual fights, man against man, kill or be killed. Whichever side could close with the enemy while remaining in a massed and coherent formation usually won the battle. The army on the offense had the advantage in that they took the initiative in choosing where to attack the enemy. Also, the sight of thousands of armed soldiers closing the gap separating the armies oftentimes caused the defender to flee before facing the attackers. The defenders, though, held an important advantage also. While the attackers were trying to move and retain a coherent formation at the same time, the defenders only had to remain standing, massed in a formation and saving their strength for the actual individual fights. The important point here is not whether armies fled in the face of the massed formations or stayed to fight. Rather, the

point is that the armies could close with each other before inflicting many casualties.

This ability to close with the enemy with little danger changed with the invention of the rifled musket. The rifled musket greatly improved accuracy, giving a force on the defensive a decided advantage over an attacking force. No longer could attacking formations cross the battleground unscathed to attack the defenders; there now was a serious price to pay for taking the initiative and attacking. The introduction of breech-loading rifles enabled soldiers to fire and reload their weapons while in the prone position, decreasing their silhouette and therefore reducing the danger of being hit. Repeating rifles along with ammunition magazines drastically increased the rate of fire. When combined with greater accuracy, the defense appeared even stronger. With the invention of smokeless powder, soldiers could almost disappear on the battlefield; acquisition and targeting became much more difficult.⁷

Attackers could still cross the ground between the forces and attack the defenders but the cost was prohibitive. The new weaponry exacted a stiff price in blood from the attacker. Defenders could remain prone for much of the time while firing at soldiers in the attack, standing upright in their march to the defender's position. Now soldiers could be shot and killed without ever seeing their opponent. The space between the attacker and the defender became known as the "deadly ground."

Field artillery played a huge role in increasing the destructive effects. The artillery's improving rate of fire, range and accuracy allowed the defender to target attacking formations even farther away. This along with the artillery's larger radius of destruction punched holes in the attacking formations, destroying the coherence of the attack. The attacking force faced a dilemma - in order to force a penetration of the defensive line, the attacker needed to attack in a massed, coherent formation, but that same massed formation provided a bulls-eye target for the defender's fires.

Armies tried to balance this inequity through technology also. The tank was developed during World War I to bust through the enemy's defenses along the trench lines. The tank was the sequel for the cavalry. However, now armor was used as protection, a main gun for strike capability and a mechanical engine for movement (implicitly, movement also provides protection). Tanks were used to break through a defense as well to exploit a successful attack. In many respects the tank was successful in filling this role; however, anti-tank weapons came of age and fought the tank for supremacy on the battlefield. The only constant throughout was the increasing destructiveness present on the battlefield.

These improvements in weaponry were the leading cause for the phenomena of the 'empty' battlefield. As weaponry improved with both longer range and better accuracy, the tightly packed infantry units on the frontal attack found that their tactical frequency (the pace at which military units move in battle) could not overcome the defender's technical frequency (the pace at which these

weapons could fire).⁸ Armies tried various tactical solutions, such as flanking attacks and envelopments. But the most dramatic change was the dispersion of soldiers within a unit and units within the attack. As weapons improved, soldiers gradually distanced themselves from their comrades to lessen the effects of the greater technical frequency exhibited by the weapons. Units occupied much more space on the battlefield than before and commanders continued to develop tactics to overcome the defense.

It is interesting to examine the evolution of the weapons technology. Obviously, an army always wants better weapons than its enemy because these can provide the advantage needed to determine the outcome of a contest. But an underlying theme has been the emphasis away from the strike weapons, the armament of decision in the past, towards the missile weapons. Before the rifled musket, missile weapons created favorable conditions for the strike weapons by attriting the enemy's formation. Technological advances, however, allowed the missile weapons to kill more and more of the enemy at a greater distance, lessening the impact of the strike weapons. As Paddy Griffith writes:

The prevention of close combat, however, has always been one of the primary functions of weaponry. By killing the enemy at a distance and in numbers one is able to put off the sickening moment of personal confrontation face-to-face. One can limit one's personal exposure to danger and decrease the effect of chance upon the outcome. Instead of plunging into a roughly even contest of man against man, the warrior with the long range weapon can hover tentatively around the perimeter of the fighting.⁹

In essence, the improvement of the missile weapons has been a coevolution between man's desire to limit himself to danger and the possibilities that

technology has afforded in the prevention of close combat. This desire to avoid close combat and technology's ability to kill the enemy farther away have continued to feed off of each other. Man's desire has provided the impetus for the technological innovations to make weapons better. But as history has shown, when one side creates a technological advantage, it usually does not take long for others to catch up. An equilibrium ensues, driving the need to find even better weapon systems.

On a microscopic level, the tank and the anti-tank weapon provide an example of coevolution between two systems. The anti-tank weapon depends on the tank for its survival. And the technological advancements in the tank since World War I have, in large part, been due to the anti-tank weapon. The evolution of either one of these systems depends on the other. As such, their future developments are linked to each other.

Not only has this technology limited the face-to-face encounters on the battlefield, but it has also appeared to limit the rate (as opposed to the number) of casualties. At Waterloo, combined casualties were 68,000 for the twelve hour battle. In the bloodiest day of the American Civil War, Antietam, 26,000 men were casualties in roughly twelve hours. In Normandy 637,000 casualties were incurred during 80 days of fighting, averaging about 8,000 casualties a day.¹⁰ This trend has continued through the Vietnam War, Arab-Israeli Wars, Battle for the Falklands and Desert Storm. As James Schneider writes, "man 'decided' to reduce his vulnerability through dispersion in order to save himself from

annihilation in combat.”¹¹ Although exceptions occur, such as the Battle of the Somme in World War I and the Eastern Front during World War II, a definite trend exists.

Today the bayonet is the only strike weapon currently fielded by the Army; all other weapons are designed to kill the enemy at a distance. The impetus for technological research has been to develop weapons with greater range, rate of fire, accuracy and lethality. Advances in the future will mirror this trend. In the future, “The introduction of high-energy weapons, electro-magnetic rail gun technology, super conductivity, and yet-to-be-identified technological improvements will continue the upward trend lines of fire, volume and precision.”¹² Some of the future fieldings of weapons might include self-contained robotic weapons used for intelligence as well as for destruction. This is merely an upgrade of the current generation of ‘smart’ weapons and brilliant munitions. Laser and directed energy weapons are being developed and may be on the battlefield within the decade. The search will continue for weaponry which can kill the enemy before he can engage us.

III. Information Technology

With units spread even farther apart with weapons which can reach past the horizon, how does a commander first get information about the enemy for targeting and then coordinate his force to mass forces or fires against that target?

Looking in the past, dispersion on the battlefield caused many problems. In Frederick the Great’s time, the commander could stand in one location and see

his army fight a battle. The information he needed to direct his force could usually be gained from a vantage point overseeing the battle. Napoleon, however because of the *Levee en Masse* and the Corps system, required staffs to coordinate actions and aides to act as his directed telescopes to keep him informed of his and his opponent's forces. As soldiers and units dispersed, the commander's ability to monitor events and actions diminished. No longer was he controlling one or two formations, but several formations as the battlefield organization spread the battle lines. Instead of the overall commander determining the action from his vantage point, he gave guidance to the tactical commanders of these separate formations.

In order to stay abreast of the battlefield conditions and provide coherence for his force, the commander was concerned with three aspects of C^2 , namely his ability to learn of the battlefield events, his ability to use the information to make sound and timely decisions and finally, his ability to communicate his decision to his subordinate commanders in a timely manner in order to influence the battle.¹³ These capabilities diminished as dispersion not only extended the battlefield but also created smaller tactical units, adding to the levels of command. In addition, these soldiers started to 'disappear' on the battlefield, caused mainly through smokeless powder and the soldiers' attempts to avoid the increasingly deadly fire. The ability to coordinate these units as well as mass the forces when needed required a vast improvement in the information and communications ability of armies.

Information requirements grew along with the battlefield. Prior to this expansion of forces, the commander basically needed to know where the enemy's mass was located; it was usually at one place on the ground. As the battle lines extended, the commander was more uncertain of the enemy's location and intentions. To complicate matters, he needed information about his own dispersed forces also. As Martin Van Creveld writes:

From Plato to NATO, the history of command in war consists essentially of an endless quest for certainty --- certainty about the state and intentions of the enemy's forces; certainty about the manifold factors that together constitute the environment in which the war is fought, ...last but definitely not least, certainty about the state, intentions, and activities of one's own forces.¹⁴

Creveld contends that throughout history, organizations have had two alternatives in dealing with uncertainty. One way is to increase the information gathering and processing capability of the organization while the other rests on designing the organization to decide and act with less information.¹⁵ Both methods have been tried and executed and arguments still abound on the efficiency of either one. The arguments usually end up as a comparison between centralized and decentralized command and control, which oversimplifies the problem of dealing with uncertainty.

A key ingredient of this argument is the effect of dispersion at the individual soldier's level. Massed formations provided impetus for soldiers to press forward their attack. As individual soldiers became more isolated from their comrades, the moral cohesion that the massed formations provided slowly waned. S.L.A Marshall wrote that:

I hold it to be one of the simplest truths of war that the thing which enables the infantry soldier to keep going with his weapons is the near presence or the presumed presence of a comrade. The warmth which derives from human companionship is as essential to his employment of the arms with which he fights as is the finger with which he pulls a trigger or the eye with which he aligns his sights.¹⁶

The importance of small unit leaders greatly increased; they were the focal point not only for coordinating their unit's actions, but in providing the moral force required to make their men fight. The overall commander could make all the right decisions and transmit those decisions down to the lowest level, but success depended upon the abilities of those tactical leaders to lead their soldiers to victory.

The same is true today. Infantry companies now occupy more space and cause more destruction than a division did in the American Civil War. Units and soldiers are more isolated than ever before. With future technology providing the capability to see deeper and deeper into the battlefield, this trend will continue. In an informational sense, new technology will continue to provide greater capabilities to find the enemy deeper and deeper on the battlefield. In a physical sense, forces will disperse even more, emptying the battlefield to an even greater extent.¹⁷

In the past, armies had difficulty massing their forces at the proper time and place as dispersion increased on the battlefield. This greater separation and isolation of units will continue to require armies to improve information capabilities. In the future, however, technology will enable armies to mass

weapons' effects at the point of attack as opposed to massing the forces themselves at a central location. Forces will remain dispersed in smaller, isolated units, possessing the capability of massing the effects of their fires against enemy forces.

The role of information will continue to increase in importance in the future. The authors of TRADOC Pamphlet 525-5 suggest that dominance in information operations will replace air superiority as the initial focus in a campaign.¹⁸ John Arquilla and David Ronfelt were even more adamant about the power of information when they wrote that, "warfare is no longer...a function of who puts the most capital, labor, and technology on the battlefield. What distinguishes the victors is their grasp of information."¹⁹ Knowledge is power and militaries will spend exorbitant amounts of money and time to gain more information faster about the battlefield environment.

Knowledge decreases uncertainty, aiding the commander in making decisions to affect his forces on the battlefield. But the goal of more certainty on the future battlefield will continue, as it has in the past, to be elusive. As Martin Van Creveld points out:

Taken as a whole, present-day military forces, for all the imposing array of electronic gadgetry at their disposal, give no evidence whatsoever of being one whit more capable of dealing with the information needed for the command process than were their predecessors a century or even a millennium ago. Though modern technical means undoubtedly enable present-day command systems to transmit and process more information faster than ever before...their ability to approach certainty has not improved to any marked extent... Nor...does there appear to be much hope of achieving it in the foreseeable future.²⁰

Creveld is speaking to the increasing complexity of the battlefield. Complexity grows as more information is being exchanged in the environment, providing more feedback, or information, to the commander.²¹ As more feedback is presented, it takes more energy and time to assess that information. As Creveld further writes:

The increasingly complex demands made by modern forces and by modern warfare, on the one hand, and the appearance of technical devices capable of meeting that demand, on the other, together have led to an explosion in the amount of data processed by any given command system to carry out any given mission. As the quantity of data rose, the difficulty of interpreting it in preparation for decision-making grew, causing staff to be piled upon staff and computer upon computer.²²

Not only is the increasing amount of information responsible for the growth of complexity but bigger staffs, more computers and a myriad network of communications equipment have furthered the rise of complexity on the battlefield.

Coevolution is at work here also. A commander wants more information and he wants it faster than his enemy. Information drives decision-making; the force which can make decisions faster on the battlefield to effect the other side will grab and retain the initiative. The other side is forced to react to the quicker decision-making cycle of his enemy. Each side continually tries to quicken its action, requiring faster information.

Armies leverage technology in order to obtain faster feedback. The growing amount of feedback causes an increase in the use of computers to organize the data and bigger staffs to synthesize the data. More and faster

communications equipment is needed to receive the data as well as to transmit instructions and orders once decisions from the information are made. Communications equipment and nodes are susceptible to interference, eavesdropping and blocking. Therefore more equipment is added to provide redundancy and insure communications are not obstructed.²³ Complexity continues to grow.

IV. The Decreasing Minute

More and faster information does have repercussions. As commanders and staffs attempt to sift through and synthesize the growing amount of data being obtained, time is passing. The increasing speed, rate of fire and range of weapons as well as the dispersion of units gives a commander less time to make decisions and give orders to his subordinates. Theoretically, more and faster information lessens uncertainty and provides the commander the means to make timely decisions required to affect his forces on the battlefield.

With the vast amount of data being examined however, it becomes harder and harder to identify the relevant information needed to make a decision. Determining that the information is pertinent, the commander and his staff must then determine its reliability.²⁴ Clausewitz wrote that "many intelligence reports in war are contradictory; even more are false, and most are uncertain."²⁵ Determining which information is relevant, reliable and true must be done quickly. Technology provides this quickness, but "with this blessing comes a curse, the desire to know too much, to gain certainty by knowing as much as

possible. It is the systems analysis problem again -- garbage in, garbage out. But now it happens at the speed of light."²⁶ And as Chris Bellamy wrote, "as one Israeli general put it, the problem is not so much providing information in 'real time', but of 'getting the real information in time', a subtle but crucial distinction."²⁷ This distinction will be even more evident on the future battlefield as the tempo continues to increase. Commanders must be prepared to make decisions with imperfect information, for:

The future battlefield will be less forgiving of slow decisions than ever before. It will not be a place for cautious, bureaucratic centralizers glued to computer monitors waiting for that one additional piece of information which will allow a "sure" decision.²⁸

For information is only valuable if it is timely, a decision must be made by the commander and communicated to his subordinate units to effect the action before the situation changes. Figure 1 (see appendix A) shows how the time to make a decision has decreased with the evolution of war.

Time is important and will become even more critical in the future for three major reasons. First, information is perishable; as more information is being collected to aid in making a decision, older information is becoming irrelevant. Second, time is a dimension which is shared by both sides. As we are gathering information to make a decision, the enemy may very well be changing the situation, forcing us to react to the changed environment. Third, the quicker tempo inherent on the modern battlefield limits the commander's ability in gathering more information before making a decision.²⁹

The commander must make a decision in an environment where the enemy is making decisions to thwart the friendly mission. Each of the forces is continually adapting to the changes on the battlefield, creating even more change. As Figure 2 shows (see appendix B), it is a race for time. Each commander is trying to act quicker than the other to take options away from his opponent.

A commander who is intent on gathering additional information before making a decision can paralyze his decision-making ability. Essentially, "the more time a commander spends processing information trying to reduce uncertainty, the slower his tempo of operations becomes."³⁰ As Robert Leonhard wrote:

Time pervades all decision making in war...Time comes before, follows after, and orders the sequence and tempo of military operations. We perceive, interpret, and understand military phenomena from a temporal perspective -- an aspect that is ultimately more important than one founded on length, width, or height. Time defines the limits of political and military power. It defines the possible and impossible. In short, there is no understanding of warfare apart from time.³¹

General Sullivan has written that the dominant characteristic of future war will be time. He argues that the increased mobility and firepower of armies will require even greater dispersion, quicker maneuverability and better communications to mass fires from dispersed locations. These factors will increase the importance of making quicker decisions.³² Put succinctly:

We are facing a time in our nation's history when the problem that generals and admirals face is not one of mass, but of minutes...The problem, then, is not one of mass, nor even the movement of mass, but rather one of the movement of mass *over time*.³³

The implication is clear. Commanders must be able to make decisions quickly with incomplete or imperfect information. Time is a relative concept; we must be faster than the enemy. Failure to do so in the future will reduce our tempo, give away the initiative and cause defeat.

V. Tempo: Can We Control It?

To this point the discussion has centered on a conventional battlefield against a symmetric opponent. This opponent will fight in much the same way we do, using similar organizations and technology in an attempt to defeat us. History has shown that we are well prepared to defeat this sort of enemy, the latest example being Iraq in Desert Storm.

However there are many more forces in the world that do not look like us; their organizations, technology and tactics are vastly different. But these “potential adversaries do not need high-technology or strictly military systems to conduct effective information warfare.”³⁴ They understand that engaging the United States military in a technologically infused mid to high intensity war would lead to defeat. Unable to generate and maintain enough tempo to present a coherent force against us, these opponents:

Are likely to attempt to redefine the terms of conflict and pursue their aims through terrorism, insurgency or partisan warfare. Such unconventional strategies focus on the population while attempting to retain freedom of action by avoiding combat with superior forces. They entail a protracted struggle...to undermine the enemy's will to continue a seemingly intractable, costly conflict without the necessity of defeating his main forces on the battlefield.³⁵

Simply, they will fight, or not fight, to slow the tempo drastically; minutes to hours, hours to days, days to weeks, etc. Realizing that our technology is built for the modern battlefield with quick decision-making as a key, these enemies will subvert this technology by presenting a vacuum of information. In these types of conflicts, satellites, unmanned aerial vehicles and other mechanical reconnaissance assets can not find what simply is not there. In addition, some of these conflicts in the future will take place in built-up areas. As Ralph Peters writes:

We will fight in cities, and this brutal, casualty-prone, and dirty kind of combat will negate many of our technological advantages while it strains our physical and moral resources...our efficacy in setting the terms of involvement will deteriorate the farther down the scale of organized conflict we must descend. No matter how hard we try to take our world with us, we...must fight the enemy on his ground.³⁶

Combating an information age army, the enemy will fight when, where and how needed to negate our capabilities to gather relevant and timely information. Information technology designed to find tanks, artillery groups, command posts and other systems particular to a conventional battlefield will be ill-equipped to provide the pertinent information required to take actions against this sort of enemy.

The problem goes much deeper than this, however. In this environment, the enemy will almost always be able to regulate the frequency of their attacks or actions. They will do this:

Not by *increasing* the pace of events, but by *decreasing* it...Frequent threats -- threats that follow the normal frequency of life -- are easy to perceive and understand...they [insurgents]

typically conduct their campaigns with a lack of rhythm and with long interludes of seeming inactivity.³⁷

Thus they direct their efforts at the psychological dimension, attempting to wear their opponent down with seemingly little activity. These situations are most often politically-sensitive; the military is deployed in a foreign country not only to get rid of insurgents and the like but to protect the population and their culture. The enemy is not apparent, at least not using the technology circling overhead. And understanding this technology, the enemy will force a slower tempo, making us wait and guess their next action:

Compare this idea [high-frequency operations] with Mao Tse-tung's view of warfare: "The oxen are slow; the earth is patient." Clearly, when these two outlooks on warfare clash, there is a serious frequency disparity. In such a scenario, the side that can force its preferred frequency on the other is the one that will prevail.³⁸

With many periods of inactivity, one tends to wonder whether there are any enemy out there. The media will play a big role in this. Every action or inaction by the military will be discussed and analyzed. Commanders will be second-guessed by anybody from the President on down to the autoworker in Detroit.

Modern information exchange systems, catalyzed by the immediacy of the American political and social climate, have the effect of telescoping the normally distinct layers of strategy, operations, and tactics, often from the bottom up. A firefight, an accidental killing of a civilian, or a misdirected shot can mushroom into major political flaps, sometimes sparking shifts in U.S. foreign policy.³⁹

The campaign can become long and drawn out. Commanders, mentally tired from dealing with isolated incidents in both space and time, might be slow to respond

to future attacks. Technology will give them information, but much of it may be contradictory; the enemy is fighting a psychological campaign to confuse and numb his enemy. Commanders must rely on foot soldiers to stay alert, report activities as well as any inconsistencies and take action when needed.

Although weapons and information technology will greatly improve in the future, they will not guarantee a faster tempo. The enemy will understand that the key to defeating an army with this type of advanced technology is to control the pace of events. Instead of simultaneous attacks to overwhelm their opponent, the enemy may very well attempt to underwhelm, spacing out his attacks and activities to play for time in both the military and political arenas.

In fighting this type of enemy, we must be aware of the peculiar limitations of our technology in these environments. The importance of clear goals and objectives with reasonable timelines cannot be overestimated. The enemy will do everything possible to throw our political and military aims into disarray. The United States military must be prepared to deal with this type of enemy.

VI. Force XXI

For the past several years, the Army has been working on a major technological initiative called Force XXI. The two major purposes for this initiative have been to increase situational awareness of the battlefield at all levels as well as to develop more lethal and precise fires for the force. Both purposes follow trends from history, namely attempts for more certainty on the battlefield

and more destructive weaponry. TRADOC Pamphlet 525-5 is the Army's attempt to visualize the strategic environment in the twenty-first century. It anticipates rapid technological innovations on the battlefield and suggests certain weapon and information systems to combat the enemy in the full spectrum of combat. Essentially, the pamphlet espouses a concept to be successful on the future joint battlefield.⁴⁰

Although the authors of the pamphlet recognize that the human element will still achieve success on the battlefield, the Force XXI initiative gives an even greater role to technology than past concepts. The technology will provide locations for each friendly unit, facilitating command and control over more dispersed units fighting on a more fluid battlefield. It will also track the enemy even deeper on the battlefield, enabling quicker and deeper strikes using new and advanced weaponry. In theory, the more perfect 'picture' provided by Force XXI information technologies will lead to better decisions due to the increased amount of available information.

TRADOC Pamphlet 525-5 recognizes that these technological improvements will enable the Army to quicken the pace of events. Find the enemy faster and hit him deeper before he can react. In many ways it is a preemptive strategy, with long-range weapon systems capable of massing fires against the enemy before the enemy can effect our operations. Continually hitting the enemy will force him to change his concept of operations, slowing his tempo

and making him even more vulnerable to further attacks. The pamphlet even goes as far to say that:

By mastering information, we can potentially command operations at an operational tempo no potential enemy can match...Such information will allow greater synchronization of effort, control of tempo, and control of force application.⁴¹

The authors further contend that "Better intelligence...will allow commanders to control and vary that tempo based on superior knowledge."⁴² The authors understand the importance of time in future conflict. But is the technology being presented under the Force XXI program, in and of itself, going to give us that superior knowledge required to effect the tempo of operations?

Previously, two major problems associated with information-age warfare were discussed. The first is that in the search for perfect or complete information, a commander may become overwhelmed and/or paralyzed by the amount of data being received. The second is the ability of an asymmetric enemy to decrease the pace of activity. In this way the enemy controls the tempo by taking little action during extended periods of time. Psychologically he tires his opponent, gaining time to gather the support of the population or world governments. Technology will not solve the enemy's ability to redefine the terms of the conflict. Relying on the technology in the Force XXI initiative to provide more certainty in these situations is simply not feasible.

In addition, the technology will not work perfectly; it never does. Circuits will break and communications will be cut at certain key times. An enemy can affect these systems as well, through his own technological means. This friction,

by causing a vacuum of information, may further paralyze a commander intent on getting as much information as he can before making a decision.

This monograph, however, will take a look at the Force XXI initiative assuming that all the reconnaissance assets, computer equipment, circuits and communications gear works as advertised. In essence, friction is still on the battlefield but it does not affect the technology. All systems work all of the time.

The selling point for Force XXI is that the technology will enable commanders at all levels to "share a *common, relevant picture* of the battlefield scaled to their level of interest and tailored to their special needs."⁴³ TRADOC Pamphlet 525-5 continues by stating that "this common picture will greatly enhance force-level dominance by enhancing situational awareness and ensuring rapid, clear communications of orders and intent."⁴⁴ The authors are implying that by looking at the same picture on their computer screen, commanders at all levels will better understand their situation. Because of this, the issuance of orders and intent as well as specific instructions will be greatly facilitated. The problem is that a picture might paint a thousand words but each commander has his own version of what the thousand word essay should look like. The view from fifty kilometers away may look quite a bit different than the view from the tank turret at ground zero. Icons on a computer screen do not sufficiently portray the situation at the foot soldier level. So what does TRADOC Pamphlet 525-5 mean by situational awareness? It gives this as a definition in the glossary:

Ability to have accurate and real-time information of friendly, enemy, neutral, and noncombatant locations; a common, relevant

picture of the battlefield scaled to specific level of interest and special needs.⁴⁵

Basically, situational awareness is a picture of everybody's location on the ground.

Compare this picture on the ground with a chessboard. A player has perfect situational awareness at all times. There is no terrain to mask the pieces, no foul weather to hamper his view. At the beginning of the game, the two sides line up in the same manner each and every time. And each piece is restricted to specific moves for the whole game. The player knows the location, to the exact space, of his and his opponent's pieces. But two different players will proceed with totally different strategies depending on their own knowledge of and capabilities in the game and what they believe to be their opponent's capabilities and strategy for the contest. The picture, the situational awareness, established the locations of the pieces but did not provide the knowledge or judgment required to execute a strategy.⁴⁶

The same applies to the technology inherent in Force XXI. The common picture by itself does not provide the impetus to execute a mission or perform a task; it is merely a tool that accounts for friendly and enemy locations. Situational awareness then, as defined by TRADOC Pamphlet 525-5, does not ensure rapid communication of orders and intents.

The danger is in believing the picture will lead to greater force coherence or dominance. Returning to the chess example, a grand master watching a novice or mid-level player making moves would quite obviously become frustrated by

errant moves and a lack of a coherent strategy by the player. The master could select a strategy for him or, out of sheer frustration, tell the player what move to make on each turn.

The overall commander fighting with Force XXI technology will oftentimes have the same ability to effect his subordinate commanders, three and four levels down. This common picture allows him to 'see' the same thing the commander on the ground is fighting. This ability to 'see' the battle could have severe repercussions:

The instantaneous flow of information up the vertical continuum means that flag officers...may have access to the same information, or even more, as the forward-deployed operational and tactical commanders. The temptation to move down that continuum will grow dramatically, particularly if augmented by the pressure of policymakers."⁴⁷

It has happened to this Army before. The advent of the helicopter brought new possibilities for the Army. But their misuse by some commanders during the Vietnam War was evident. Because of their speed and flexibility, they were often used as command platforms. Martin Van Creveld writes about some commanders who, flying above a firefight or battle, issued instructions and orders because they had a clearer view of the action. During some engagements, helicopters would pile on top of each other as each successive commander wished to control the action. In Vietnam, commanders rarely had more than one of their subordinate units in a fight at one time. Creveld maintains that this should have led to decentralization and a flattening of the hierarchy of the organization, but:⁴⁸

Instead, it led to a different phenomenon. A hapless company commander engaged in a firefight on the ground was subjected to

direct observation by the battalion commander circling overhead, who was in turn supervised by the brigade commander...With each of these commanders asking the men on the ground to...explain the situation, a heavy demand for information was generated that could and did interfere with the troops' ability to operate effectively...the telescopes in question were frequently so powerful as almost to paralyze the action they were supposed to monitor.⁴⁹

Certainly, there are times when the commander should monitor and direct a subordinate commander; Force XXI technology provides this potential. But when the exception becomes routine, when the commander becomes enamored by the possibilities the technology provides in controlling his subordinate commanders, the commander limits his ability to see and understand the overall situation.

General Foss wrote that:

Commanding too far down gives one a stereoscopic view, and this tunnel vision inhibits the ability to "see" the overall battle. The absolute worst effect of such a command style is that the chain of command goes into "neutral" and steps out of its responsibilities when a senior commander usurps its authority. That commander then misses the most vital input he needs - a subordinate commander's assessment of his unit's capability.⁵⁰

Excessive control can stymie initiative, causing inflexibility for the force.

Subordinate commanders unwilling or unable to make sound, timely decisions on the battlefield will fail in their attempts to complete the mission given the changing environment surrounding them.

For the health and resilience of a unit depends on the decisions made at the lowest levels. Ideally, "command decisions are not so much made at the top level as they are generated from the bottom up."⁵¹ The commander commands his force but in reality is led by the decisions his subordinates make in combat. The

commander's success lies in his subordinates' abilities to recognize a situation, understand its significance and determine when and what decisions must be made to effect the outcome.

The authors of TRADOC Pamphlet 525-5 imply that the recognition of a situation and its impact on the force will be apparent because of the information obtained through the common picture. The implication is that situational awareness provides the relevant information required to take the initiative to further the commander's intent. But there appears to be a disconnect between what the technology provides and what the subordinate commanders can do with it. The technology, the computer screen, supplies information to the user. Information is defined as "data collected from the environment and processed into a usable form."⁵² Technology takes the raw signals, bits and bytes, from the environment, and processes them into a context which can be understood. The recognition of this information comes from knowing the situational context that the data is applied against.

But the information by itself, such as the 'common picture,' has little value by itself. Value is added when we process and correlate the information to provide a means to evaluate its relevance, reliability and importance.⁵³ By analyzing the information, we gain knowledge about what the information really means to the force.

As we gain knowledge we begin to see the relationships between events in the battlespace, to fathom the way an enemy thinks, and to protect what he might do. More importantly, at this level we begin to recognize some of the things that will forever remain unknown -- and thus identify the uncertainty we must deal with.⁵⁴

Realizing that uncertainty will be forever present on the battlefield, commanders use knowledge to comprehend the different units' actions and their significance to the overall mission.

But there is one more step for the commander:

Military judgment clears through the ambiguity of the battlefield. In war order, knowledge, and cohesion become chaos, confusion, and disorder. This creates new variety: information without meaning. Human judgment works on this raw material we call ambiguity and turns it into understanding.⁵⁵

Judgment is needed for understanding. It is based on a commander's experience, training and personality. Judgment takes knowledge and applies it to a commander's thought process to provide understanding for the hidden dynamics of a situation. The important difference between knowledge and understanding is that "we may *know* what is going on; we *understand* why."⁵⁶

Technology is limited because the best it can give us is information.

Knowledge and understanding can only come from the human side. Cognition and judgment are required to turn technology's information into knowledge and understanding.⁵⁷ By understanding the dynamics in the conflict, commanders are then better prepared to adapt to the changing circumstances of the battlefield.

VII. Nested Concepts

In order for leaders to use judgment and understanding, there must be a situational context, a framework to guide their actions. By understanding the framework they are working under, soldiers can take actions toward a common goal, producing unity of effort. The commander's vision establishes the common

goal; the vision is the guiding light for the organization. Its importance lies in providing a beacon to guide subordinates' actions through fog and friction.

Vision includes the commander's perception of the current situation as well as his mental image of his desired end state. But it is more than that. The commander's responsibility is to:

translate, then transmit his vision into terms soldiers understand and execute. He must not only form the picture of the current and future end states, together with the bridge of action that will link the two in his mind; he must be able to form this picture in his soldiers' minds.⁵⁸

A commander's vision must also include his subordinates' requirements and responsibilities within his mental image. Thus the vision must include a means to get there.

Picture a compass course (see appendix C). Private Jones is required to move from point A for six hundred meters on an azimuth of 90 degrees to reach point B. He pulls out his compass, faces north and aligns the north magnetic arrow with 360 degrees on the bezel ring ((1) in appendix C). Standing still, Jones turns the bezel ring until the 90 degree mark is on line with the north magnetic arrow (2). He then turns to the right until the north magnetic arrow again lines up with 360 degrees (3). He is now facing to the east prepared to start his route. Reflect on what Private Jones has done. He has found his azimuth by utilizing the constant direction of the north magnetic arrow. The arrow is the commander's intent, guiding Jones to his destination or end point. Although the

soldier can employ any of several routes to point B, the magnetic arrow remains pointed to the north; his commander's intent remains constant.

The commander's concept of operations calls for Private Jones to walk directly to point B. Jones is given the concept in two parts. He is given the *task* of walking on an azimuth of 90 degrees for six hundred meters for the *purpose* of reaching point B. Point B does not necessarily represent a physical location. It represents the purpose which Private Jones' commander has deemed Jones must accomplish to support the commander's intent.

Private Jones begins walking on an azimuth of 90 degrees, keeping track of his pace count. At two hundred meters, he encounters thick brush and vegetation (a), so dense that he cannot walk through it. The vegetated area is approximately three hundred meters wide and two hundred meters long. Jones needs to go around the vegetation and does it in the following manner. He walks 150 meters to the south (b), turns to the east and walks 200 meters (c) and then turns north and walks another 150 meters (d), bringing him back on line directly between points A and B. Since he is back on line, he adjusts his bezel ring again for an azimuth of 90 degrees and continues for another two hundred meters until he reaches point B. To get from Point A to B, six hundred meters apart, Jones walked nine hundred meters.

In order to impart his vision to Private Jones, the commander used both the commander's intent (magnetic north arrow) and the concept of operations (task of walking six hundred meters on a 90 degree azimuth for the purpose of

reaching point B). The commander's intent provides the purpose, keys to success and desired end state for the organization. It points the way for the entire organization. The value of commander's intent is that it unifies subordinates towards a common goal, or objective.

The intent does not, however, establish the framework on how to get from the current state to the desired end state. The concept of operations provides this 'bridge of action' to subordinates. It assigns a task and purpose to each subordinate maneuver commander. The value of the concept of operations is that it establishes the subordinates' relationships within that unifying image and informs them of their responsibilities to attain that common goal. It provides a common understanding of what must be done and how it will be done to unify subordinates' actions in attaining the commander's vision. To use commander's intent without the concept of operations or vice versa bankrupts the idea of unity of effort.

The concept of operations must include both a task and a purpose. Suppose Private Jones did not know his purpose, reach point B, in the concept of operations. Upon encountering the vegetation, he has nothing other than the task of walking in a specific direction for a certain number of meters to fall back on. Jones can still refer to his magnetic north arrow. But if he does not understand his distinct purpose assigned to support his commander's intent, his actions will most likely not conform to his commander's vision. The north arrow is not there for Jones to follow, but an instrument for him to guide him to point B. Merely

following the north arrow leads to the overall organization's purpose, not the specific role that Private Jones plays to accomplish his commander's intent. Knowing only the task, Jones has no choice but to hack through the bushes and briars in the same direction. By doing this he expends valuable energy and time in trying to break through the fog and friction, possibly leading to culmination. Not understanding his purpose makes Private Jones inflexible to changes occurring on the battlefield.

But Jones was flexible - because he understood his purpose and its relationship to his commander's intent. The commander's concept of operations called for a direct route to point B. But the vegetation, representing fog, friction, chance or an enemy applying his will, prevented Private Jones from following the exact route. The environment changed. But Jones found another way to attain his purpose, get to point B. He still used the north magnetic arrow to guide him; he merely turned his bezel ring to attain the needed azimuth on his compass, changing his direction, or his actions, to complete the course. The route was not the same as his commander defined, but Jones arrived at point B nonetheless.

A different soldier, Private Miller, might have a knack for geometry and trigonometry; he could easily shorten the distance from nine hundred to eight hundred meters by walking directly to point B once he reaches the southeast corner of the vegetation(c). He simply walks on an azimuth of 53 degrees from there to reach point B.⁵⁹ Private Miller typifies a subordinate with more experience and training. He still had to account for the vegetation but once past it,

he could directly travel to point B without getting back on his original azimuth line. Miller's experience enabled him to direct his action, turn his bezel ring, to get to point B by a more direct route than Private Jones, saving time and effort. Jones, on the other hand, referred back to the original task as soon as he could because of his lesser experience.

The concept that the commander issued to Jones provided insight into how the commander wanted to attain his goal. Privates Jones made immediate adjustments to the route because he understood the commander's vision. He recognized changes to the environment and adjusted his actions to account for the new information. Realize that Jones still dealt with uncertainty. When he reached the thick vegetation, he had little idea how deep the underbrush continued along his route or even if there was a clearing within the borders of the undergrowth. If the vegetation had been only thirty meters thick but six hundred meters wide, Jones might have actually lost time by going around it. Understanding his commander's vision is no guarantee that Jones will always make the right decision when dealing with uncertainty. The vision will, however, provide a framework and a point of reference from which Jones can better judge his course of action.

The commander offered his expertise to Private Jones when he instructed Jones how to reach point B. The commander looked at different courses of action, different routes to point B. Using his experience and training along with his knowledge of the situation, the commander decided that the best course of action

was for Jones to walk due east for a distance of six hundred meters. This is what a commander does when he assigns a task or tasks to a subordinate. He is telling the subordinate that, “in my opinion, if you accomplish the task(s) I have assigned to you, then you will accomplish your assigned purpose in the concept of operations to support my overall commander’s intent. Accomplishing your purpose will enable me to accomplish my intent.” The commander is also telling his subordinate that “the purpose is inviolate; you may adjust your task on the battlefield to ensure you accomplish your assigned purpose.”

Imagine that the commander gives a different concept of operations to Private Jones. Intelligence assets have identified the patch of undergrowth on the course. The commander assigns the actual nine hundred meter route Jones walked in the example. As Jones is walking south along the underbrush (from (a) to (b)), he notices a clear path through the vegetation. Expecting to save time and increase his tempo towards his goal, Jones takes the trail. He is able to adapt, to change the route. All the time he remains focused on accomplishing his purpose of reaching point B.

It is essential for soldiers at the lowest levels to take the initiative to ensure they accomplish their purpose. Employing initiative also aids in maintaining the tempo of the organization, using time to their advantage instead of waiting for instructions. But soldiers who take the initiative, not understanding the commander’s vision, can and often will be detrimental to a unit. In order to be beneficial, a soldier’s initiative must be directed towards some goal consistent

with the vision. Private Jones' tempo was interrupted because parts of his route ((a) to (b); ((c) to (d)) were not getting him any closer to the end point. But he was able to maintain speed on the course to regain the tempo as fast as possible. He did not have to wait for his commander to make a decision because he understood how his actions would affect the organization's common goal.

Private Jones understood his commander's vision because he was given his commander's intent and a concept of operations. In current doctrine, commander's intent is mentioned frequently. It is justifiably acknowledged as the most important part of an operations order. The authors of FM 100-5, when discussing commander's intent, write that:

It is the single unifying focus for all subordinate elements...Its utility is to focus subordinates on what has to be accomplished in order to achieve success, even when the plan and concept of operations no longer apply, and to discipline their efforts toward that end.⁶⁰

Because the commander's plan oftentimes 'does not survive contact with the enemy,' we relegate the concept of operations to second-class status. Doctrine tells us to constantly look towards the intent for guidance and rightfully so. But the concept of operations is indispensable in fully understanding and comprehending the commander's vision.

COL James Dubik, writing to clarify the issues of initiative and control, states that:

Senior commanders want to conduct coordinated, synchronized battles. And to do this, they need control. But the demands of initiative and control seem conflicting, almost paradoxical. This paradoxical relationship of initiative and control, however, is more apparent than real. The paradox is resolved in the proper

understanding of the relationship between the commander's intent and the concept of operation.⁶¹

The problem is that we too often associate commander's intent with freedom of action and the concept of operations with control. Freedom of action is lauded while control is grudgingly accepted. However, the intent and concept are both controlling mechanisms. It is the control inherent in both which enables a subordinate to use his judgment and take the initiative when necessary.

The key is realizing that...the commander's intent is, itself, a type of control measure and, when properly used, controls a subordinate in that he exercises his initiative within that intent...it guarantees both that the senior commander's will controls the battle and that subordinate commanders can exercise their initiative.⁶²

In providing a purpose, the intent focuses subordinates on a common goal. The concept of operations, by providing tasks and purposes for subordinates, unites those subordinates' efforts in attaining that goal.

The purpose assigned in the concept of operations establishes the subordinate's role within the parent unit. That purpose in his commander's concept becomes the subordinate's purpose for his mission. It identifies not only his responsibilities to his commander vertically, but also his responsibilities, if any, to his fellow commanders horizontally.

The compass course example illustrates the vertical linkage between the commander and his subordinate. Private Jones' purpose supports his commander's intent. However, the compass course does not show the horizontal linkage required in a concept of operations. The horizontal linkage provides the interrelationships between the subordinates in the unit. It reveals how

subordinates support each other in achieving a common goal. As important as the vertical linkage, the horizontal linkage unites the subordinates' efforts within the concept.

We stated earlier that a commander's responsibility is to "translate, then transmit his vision into terms soldiers understand and execute." Creating a vision does no good if the commander cannot plant that vision in his subordinates' minds. Nested concepts accomplishes this; it imparts the commander's vision to subordinates defining not only their task and purpose, but also the relationship of each task and purpose in achieving the concept. FM 100-5 defines nested concepts as a "concept whereby each succeeding echelon's concept is nested in the other."⁶³ This explains vertical linkage but not horizontal linkage. At each level of command, commanders provide intents and concepts to unite their subordinates vertically and horizontally in a coordinated effort to successfully complete a mission. By nesting concepts, and thus purposes for subordinates, the commander achieves unity of effort in his unit.

This is the genius of the system -- a centralization of concept, a decentralization of execution and a full exploitation of forces and opportunities. Cascading concepts carry the top commander's intentions to the lowest levels, and the nesting of those concepts traces the critical path of concentration and priorities.⁶⁴

James B. Burton, in his monograph, describes nested concepts as providing:

The intended contributory battlefield effect required of the tactical unit. A vertical and horizontal purpose analysis fixes the relationship of the unit's purpose to other higher and adjacent plans. The determination of the purpose and its relationship to higher intentions for establishing positive control of the freedom of action is tantamount to the idea of nested concepts.⁶⁵

Inherent to the idea of nested concepts is the belief that a vision is not just pictures of the current situation and desired end state. To impart only this 'vision' leaves subordinates guessing at their responsibilities in attaining the end state. Providing a concept informs subordinates of their requirements and responsibilities within that organization. Thus the vision must include a means to get there.

Establishing subordinates' requirements to higher headquarters as well as the relationships with each other is an integral piece of the concept. This entails designating a main effort along with supporting efforts within the command.

Marshal Mikhail N. Tukhachevski called a commander who failed to designate a main effort with its supporting efforts a 'corridor commander.'

Commanders with a poor understanding of the essence of maneuver, i.e. the union of efforts, prefer, most of all, to divide the area of their maneuver uniformly among their subordinate units and demand the same results from all. It is a misfortune to be subordinated to such a "corridor" commander. A completely opposite picture obtains with good, efficient leadership...A clearly posed objective and an internally coordinated plan mobilize all the resources and equipment and rouse and direct the spirit and enthusiasm in a clearly comprehensive direction .⁶⁶

Nested concepts requires more than just the designation of main and supporting efforts in the concept of operations. The designation of a main effort pertains to the purpose assigned to the subordinate unit. When a commander designates his main effort, he is, in essence, stating that "this force is my center of gravity. I need to protect this force because it is achieving the purpose which, if successfully accomplished, will directly result in my mission success."

The main effort may shift between units, but the purpose of the main effort must remain the same. If Alpha company assumes the main effort from Bravo company, then Alpha company must take on the same purpose which Bravo company had. This ensures that all subordinates are focused on supporting the accomplishment of that purpose which will achieve the commander's intent. This may happen because an opportunity is seized or the unit designated as the main effort culminates and can no longer accomplish its purpose.

Supporting efforts are then designated to protect and enable the main effort's successful accomplishment of its purpose. These supporting efforts may directly or indirectly support the main effort. If Alpha company is guarding the flank of the main effort force, then it is directly supporting the main effort. A scout platoon which is screening Alpha company's flank is indirectly supporting the main effort by enabling Alpha company to perform its mission.

Nested concepts is not about smarter tactics, although they obviously help. It is about ensuring unity of effort for an organization. Nested concepts provides the means to collectively coordinate an organization's efforts in order to attain the commander's intent. The following example will illustrate these points.

At the United States Army Command and General Staff College, school year '95-'96, the first operations order handed out in C310, Fundamentals of Combat Operations, was for the 55th Mechanized Division to defend. Its task was to defeat a mechanized enemy Army forward of PL BLUE (rear boundary of

brigade sectors). The purpose was to establish conditions for the corps counteroffensive. The concept of operations, in part, read:

55th Avn Bde, initially the main effort, accepts battle handover from 208th ACR [Armored Cavalry Regiment] and guards from...On order, aviation brigade hands over the battle to MBA [Main Battle Area] brigades. 2d Bde, the main effort in the west, and 3d Bde, the supporting effort in the east, defend in sector to defeat attacking elements of 2 Army forward of PL BLUE...1st Bde, the division reserve, occupies AA [Assembly Area] LYNX and prepares to counterattack to prevent any penetration of PL BLUE.⁶⁷

Two problems are apparent in this concept. First, the main effort and its purpose shifted from 55th Avn BDE to 2d BDE. Second, the concept identified a main effort (2d BDE) and supporting effort (3d BDE) in the main battle area but assigned them the same task of defeating the attacking elements (this concept failed to include the purpose for the brigades accomplishing this task).

The shifting of the main effort only muddles the focus of the division in this concept. The concept of operations designated the main effort to the force who would be most heavily engaged at a certain point in time. In the guard mission, the 55th Avn BDE would be in contact with the enemy while the other maneuver brigades were preparing defenses; therefore the commander designated them as the main effort force for this event. In doing so, he misunderstood the application of a main effort; a main effort is not assigned to the unit which happens to be in contact with the enemy at the time. The commander must assign the main effort based on the purpose the unit is accomplishing.

55th Avn BDE is performing a guard mission which by definition must be a supporting effort (the guarding unit must be guarding someone). In this example, the aviation brigade is a supporting effort to allow the main battle area brigades to build their defenses. Even if the guard mission is successful, the division mission is not necessarily accomplished. Therefore the aviation brigade should not be designated the main effort at any time during the mission.

In the main battle area, the concept of operations designated main (2d BDE) and supporting (3d BDE) efforts but gave them the same task and, by implication, the same purpose. This is an example of Marshal Tukhachevski's corridor commander problem. General Depuy, echoing Tukhachevski's sentiments wrote that:

The baleful legacy of those control measures, when substituted for tactical operational concepts, is still with us. They still provide a way out for the unimaginative, risk-averse commander -- a commander who passes the conceptual buck downward to his subordinates -- a commander who simply divides his attack mission into zones and his defense mission into sectors and his objectives into goose eggs distributed equally to his subordinates, and finally Capt. Jones of A Company with a narrow zone assigned and an objective one kilometer straight ahead moves into the killing zone alongside Capt. Smith of B Company, who fights his parallel battle to a similar objective -- alone.⁶⁸

This concept failed to establish unity of effort for the division. The division commander designated 2d BDE as the main effort, in part, because 2d BDE's sector contained high speed avenues of approach for the enemy mechanized forces. The 3d BDE sector limited maneuver to a greater extent because of its terrain and thus was made a supporting effort. But by giving the same task and

purpose to each brigade, the two brigades were ordered to fight separate battles. No coordination to unite their efforts against the enemy was produced besides the obvious flank coordination between the brigades. No synchronization of efforts were included in this concept. 2d BDE as the main effort is left to fight its own battle with no help from its sister brigade.

Although there are many possible solutions to this situation, an alternative is listed below:

55th Avn BDE, a supporting effort, accepts battle handover from 208th ACR and guards along...to allow the preparation of defenses by the MBA brigades. 3d BDE, a supporting effort in the east, defends in sector to block enemy forces forward of PL... to cause the enemy to commit his follow-on forces against 2d BDE. 2d BDE, the main effort in the west, defends in sector to defeat enemy attack forward of PL BLUE in order to establish conditions for the corps counteroffensive. 1st BDE, as division reserve, occupies AA LYNX; be prepared to destroy enemy elements bypassing or penetrating 2d BDE defenses to allow 2d BDE to remain a viable force in current defensive positions.

Unity of effort is achieved.⁶⁹ Each of the supporting efforts directly supports 2d BDE. The aviation brigade guards 2d BDE to allow preparation time for the defense; 3d BDE blocks to cause the enemy to force his attack through 2d BDE (by blocking the enemy, 3d BDE also implicitly protects 2d BDE's flank). 1st BDE allows 2d BDE to remain focused on the enemy to their front by destroying any enemy elements which get past 2d BDE's defenses.

One more point in the original 55th Mechanized Division's order merits discussion. When the division commander assigned 2d BDE as his main effort, he weighted his main effort by giving 2d BDE priority for most assets (artillery,

engineers, maintenance, etc.). In FM 71-100, Division Operations, the authors wrote that:

The division weights the main effort with additional tactical units, engineers, air defense, CSS, and reinforcing artillery fires. It ensures that every available weapon system is directed towards supporting the main effort.⁷⁰

Both the division order and the authors of FM 71-100 confuse the terms weighting and supporting; they do not mean the same thing.

Weighting is a vertical linkage between the commander and his subordinate. By weighting, the commander assigns additional resources to the subordinate in order to accomplish his mission. The commander must assign his assets to subordinates by looking at the task and purpose he has established for them. The main effort may very well need the majority of assets and resources to accomplish its mission. But resources should not be allocated to a unit simply because it is the main effort; the main effort does not always have the hardest task and purpose in the organization. In the 55th Mechanized Division, 3d BDE requires priority for countermobility assets because they were given the task to block the enemy force attacking them, an engineer-intensive task. 1st BDE requires priority of mobility assets to ensure they can move from AA LYNX when needed. When assigning resources, the commander must ensure that he apportions the assets commensurate with the task and purpose he has given the unit.

Supporting the main effort contains both vertical and horizontal linkages. Vertically, the commander supports his main effort unit by assigning

responsibilities to other units which set favorable conditions for or directly support the main effort. FM 71-100 is correct in stating that every weapon system should support the main effort. This is the horizontal linkage. Each weapon system contained in a supporting effort unit is in support of the main effort. Using nested concepts, the purpose assigned to the supporting unit ensures unity of effort in support of the main effort.

Unity of effort is the key. All elements in the organization work to ensure that the main effort is successful. The main effort, in turn, accomplishes the purpose of the parent unit; the main effort's purpose is the same as its parent unit's purpose. If the main effort is successful, then the parent unit's intent is satisfied.

There is one exception to the main effort's purpose being identical to its parent unit. It concerns the ability of the unit to attain the purpose by itself and is related to the assets and resources available to that unit. At some level, as the nested concepts filter down through the units, it will not be possible for the subordinate force designated as the main effort to accomplish the purpose of its parent unit. This will require the commander at that level to adjust his concept in order to support his commander's intent. The following example will reinforce this point.

A battalion commander, as a supporting effort within the brigade, issues an order to seize objective (OBJ) IRON for the purpose of guarding his brigade's right flank for their attack further to the north. For simplicity sake, we will only

use two companies in this example. In the concept of operations, Alpha company is designated the supporting effort and is tasked to breach a wire/mine obstacle to enable Bravo company's unimpeded passage through the obstacle. Bravo company, the main effort is tasked to seize OBJ IRON for the purpose of guarding the brigade's right flank for their attack further to the north. OBJ IRON is a hill mass with a high speed avenue of approach as well as other slower approaches running through it which lead to the flank of the brigade.

Notice that Alpha company is not the main effort at any time during this mission even though the battalion commander expects them to be the only unit in contact while breaching the obstacle belt. Their purpose is to support the main effort. Bravo company as the main effort, by seizing OBJ IRON, accomplishes the battalion commander's purpose of guarding the brigade's flank. Alpha and Bravo companies' purposes are nested within the battalion's concept, supporting the commander's intent.

The battalion commander believes that Bravo company has the assets required to guard the brigade's flank. The commander makes this decision based on the enemy, terrain and status of his forces. He therefore assigns Bravo company the same purpose as the battalion. However, the Bravo company commander, when conceiving his concept of operations, does not believe that any of his platoons can accomplish the company's purpose (and the battalion's purpose) by itself in this situation. None of his platoons has the combat power or the resources required to guard the brigade's flank. In this case the company

commander must still identify a main effort but with a different task and purpose. He may assign his main effort the task of retaining control of the main avenue of approach through OBJ IRON in order to deny the high speed avenue of approach for the enemy's movement. The other platoons are then designated supporting efforts along the other avenues to protect and enable the main effort platoon to accomplish its task and purpose.

Nested concepts assigns purposes, and thus responsibilities to each subordinate commander and

Each successive commander is expected to articulate and elaborate that concept in accordance with the particular conditions of enemy, terrain and resources at his level; thus, the higher concepts are progressively tuned to local reality.⁷¹

Nested concepts is essential for imparting the commander's vision throughout the organization. This nesting ensures unity of effort by providing subordinates with a common view of what must be done to successfully achieve the purpose. This shared vision will be increasingly valuable on the future battlefield with technology providing a huge information capability.

The meaning of any information gained by the commander is driven by the image that frames it, and the value of that information is determined by the manner in which it fits into the image. Therefore, staff members must share their commander's image if they are to understand and supply his information needs.⁷²

The mental image furnishes the impetus for information gathering by providing for common understanding. It prioritizes the importance of specific information. Without a context with which to evaluate information, commanders and staffs are vulnerable to being overcome by the profusion of information. Conceptualization

of the vision directs information gathering assets and aids in acquiring meaningful information.

Subordinates who share their commander's vision will be better prepared to exploit opportunities presented on the battlefield. In an age of increasing tempo, the ability to take advantage of opportunities is more sensitive to time than ever before. This is especially true in low intensity environments when fighting an enemy trying to slow the tempo; when the enemy does take action, we must respond quickly and aggressively. Opportunity prompts delegation while concerns for unity of effort spur centralization.⁷³ Nested concepts accomplishes both - controlling forces through a central framework: cascading purposes, allowing subordinates to take the initiative within the context of what the commander wants.

Nested concepts ensures cohesion. As the concepts proceed down through each level of command, each and every commander is defining his concept for his particular environment. Throughout the process, the subordinate commander refers back to his superior commander's intent and concept of operation. The commander's vision is passed further and further down the organization, ensuring coordinated efforts in attaining the goal. Armed with his commander's vision, the subordinate is capable of taking initiative, acting quickly and adapting to overcome the enemy's will, friction, fog and chance.

VIII. Conclusion

General Sullivan wrote that a false belief has always been that some new and improved technological innovation would be discovered which would provide “perfect, real-time” information for the commander.⁷⁴ Force XXI technology is getting closer to attaining this perfect picture. But technology will never fully solve the uncertainty present on the battlefield. This monograph embraces the adage that ‘the more things change, the more they remain the same.’

Change on the battlefield will continue to accelerate as both weapon and information technologies evolve into the future. As technology’s use expands on the battlefield, so too will complexity. Uncertainty will be present no matter what enemy we face. Future weapons will be able to kill more people faster and farther away than ever before. Information technology will continue as a growth industry for the military, providing more and more information at a faster rate than ever believed possible. Actions will occur faster, causing the commander to make decisions quicker. Situational awareness will be better. However, due to the compression of time in the future, a commander may not have much better information with which to make decisions than he did in the past.

Sensors, computers and communications systems will never make the tough decisions required on the battlefield. Computers do not know opportunity when they see it. Machines do not redirect their actions when the concept is in jeopardy; only humans use judgment and seize the initiative. Machines can, however, be instrumental in the success of a mission. They can provide valuable

information in a timely manner. The key is to know how to use this information capability.

While technology will be a significant aid in battle command, the constantly changing nature of battle requires the adaptability, judgment, and intuition only the human dimension -- the commander -- can bring. Human beings input the information, make decisions based upon it, and act upon it.⁷⁵

To make decisions, a commander requires more than simply a picture of the current situation on the computer screen. He requires a mental image of where he wants that situation to be in the future.

But simply developing a vision, his mental image, is not enough. He must communicate the image to his subordinates. And he must ensure that his subordinates understand his vision so the subordinates can pass the image down. The commander's image must focus his subordinates; it must coordinate his subordinates towards a common goal. The subordinate's responsibility is to continually direct and redirect his actions to support this mental image, like the soldier using the magnetic north arrow on the compass course. As units get smaller and more isolated from each other, this shared mental image grows in importance and will remain essential for maintaining unity of effort and a cohesive organization.

Nested concepts is a vehicle to communicate this mental image throughout an organization. It controls a subordinate's relationship with his commander and his fellow commanders. But it does not control his actions. The subordinate is

free to redirect his actions as long as those actions remain true to his purpose as expressed in the concept of operations.

The examples discussed in this monograph facilitate a full understanding of the concept and its importance in implementing the commander's vision. Much tougher situations await commanders on future battlefields. Defining purposes to unite the efforts of units will not be readily apparent. The enemy and the terrain will make it hard for supporting efforts to fully support the main effort. Nested concepts is not a template with ready-made tasks and purposes to be thrown over each scenario. Each situation is different, requiring rigorous analysis and judgment in determining the unique contributions from each unit.

Decisions made by a corps commander will affect hundreds of platoons underneath him. He cannot possibly direct every platoon in his command towards accomplishment of their mission, but:

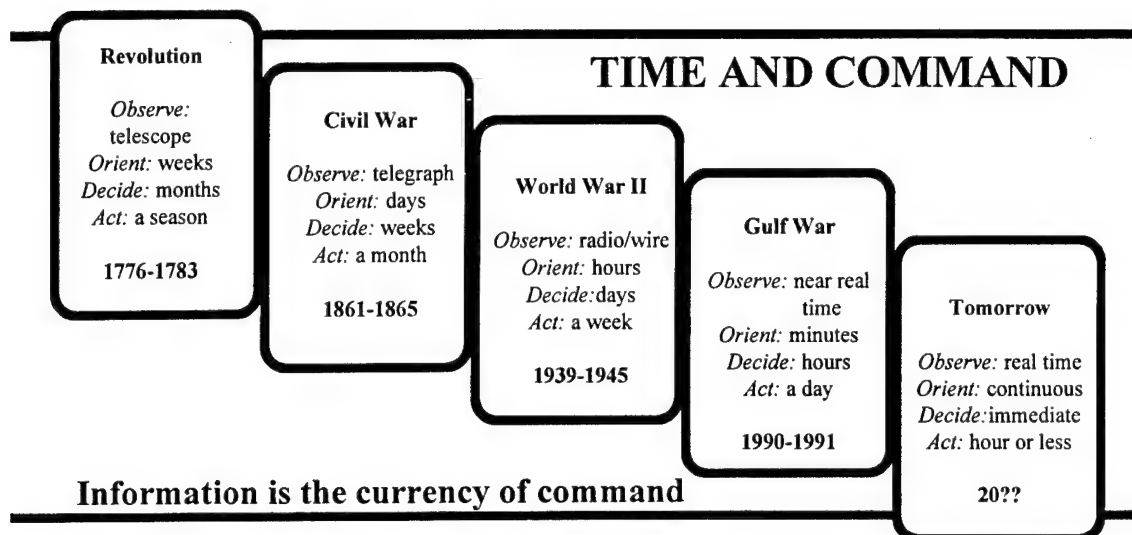
He is content to know that their actions will derive from his concept as it cascades down through his command and as each commander, in turn, embraces and articulates that concept in one of his own, which is adapted to the unique circumstances in his zone or sector.⁷⁶

War is a human endeavor. The organization includes leaders with different skills, backgrounds, experiences and training. Some subordinates will grasp the vision by reading their commander's intent and concept of operations in the order. Others will need further explanation after the orders brief to understand their unique contribution. Still others may require the commander to visit their location and talk them through their task and purpose on the ground. The

commander's responsibility is to instill a common vision in each of his subordinates.

Implementing this vision will enable subordinates to use their judgment and take the initiative when required to accomplish the common goal. Nested concepts provides the framework which enables subordinates to make timely decisions that will ensure the success of the unit. In this manner, the subordinates will lead their commander to mission success.

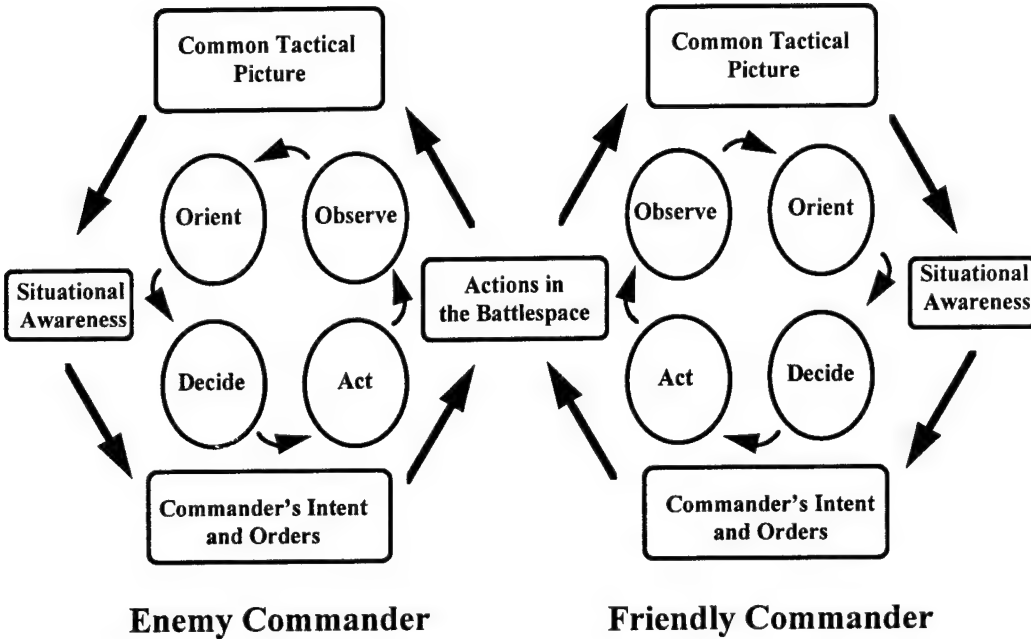
Appendix A (Time and Command)



Time and Command

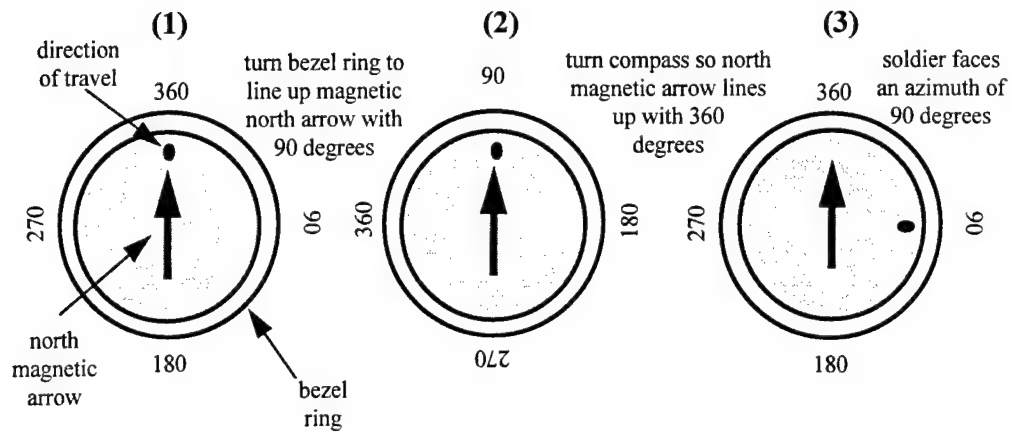
Gordon R. Sullivan and James M. Dubik, *Envisioning Future Warfare*,
(Fort Leavenworth, KS: US Army Command and General Staff College Press, 1995),
figure 1, pg 44.

Appendix B (Interaction of Friendly and Enemy Decision and Execution Cycles)

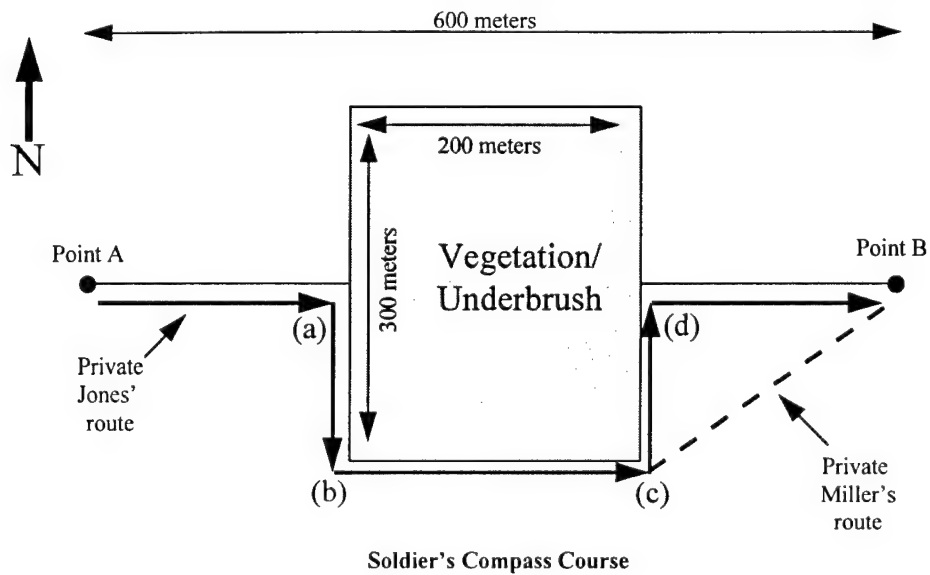


Interaction of Friendly and Enemy Decision and Execution Cycles
Department of the Navy, *Naval Doctrine Publication 6: Naval Command and Control*,
(Washington, D.C.: Department of the Navy, 19 May 1995),
figure 4-1, pg 60.

Appendix C (Soldier's Compass Course)



Note: Compass patterned after a Silva compass design



Endnotes

¹ Department of the Army, *Coordinating Draft of FM 100-5 Operations*, (Fort Leavenworth, KS: Command and General Staff College, 14 January 1997), i.

² Dennis H. Long, "Command and Control - Restoring the Focus," *Military Review*, vLXI, no. 1, (November 1981): 44-45.

³ Nested concepts is treated as a singular idea in this monograph. The verb forms used with the term 'nested concepts' reflect this.

⁴ These attributes which will be provided by the Force XXI initiative are discussed in U.S. Army Training and Doctrine Command, *TRADOC Pamphlet 525-5, Force XXI Operations: A Concept for the Evolution of Full-Dimensional Operations for the Strategic Army of the Early Twenty-First Century*, (Fort Monroe, VA: U.S. Army Training and Doctrine Command, 1 August 1994), 3-3 to 3-7, 3-17.

⁵ Robert R. Leonhard discusses these two types of weapons and their purposes in *Fighting by Minutes: Time and the Art of War*, (Westport, CT: Praeger Publishers, 1994), 14-16. For a more in-depth discussion on the various weapons, see John I. Alger, *Definitions and Doctrine of the Military Art*, The West Point Military History Series, ed. Thomas E. Griess, (Wayne, NJ: Avery Publishing Group, 1985), 33-37. Also included at the end of the book is a fold-out page which shows the evolution of weapons from 350 B.C. to the present.

⁶ For a summary of formations and weapons used during this time, see Martin van Creveld, *Technology and War*, (New York: The Free Press, 1991), 9-23.

⁷ For a more in-depth discussion of the linkage between technological inventions and their effects on the battlefield, see James J. Schneider, "The Theory of the Empty Battlefield," *Journal of the Royal United Services Institute for Defence Studies* (Great Britain), v132, no. 3, (September 1987): 38-40.

⁸ For a discussion on the dilemma armies faced reference technical versus tactical frequency and their attempts at finding solutions, see Leonhard, 75-77.

⁹ Paddy Griffith, *Forward Into Battle*, (Novato, CA: Presidio Press, 1990), 177.

¹⁰ Ibid., 178-9. Griffith has a more complete listing of casualty rates on these pages.

- ¹¹ Schneider, 42.
- ¹² Gordon R. Sullivan and James M. Dubik, *Envisioning Future Warfare*, (Fort Leavenworth, KS: U.S. Army Command and General Staff College Press, 1995), 14.
- ¹³ Arthur J. Athens, *The Directed Megaphone: A Theater Commander's Means to Communicate His Vision and Intent*, (Fort Leavenworth, KS: School of Advanced Military Studies, 13 May 1993), 1.
- ¹⁴ Martin van Creveld, *Command In War*, (Cambridge, MA: Harvard University Press, 1985), 264. Hereafter cited as van Creveld.
- ¹⁵ Ibid., 264.
- ¹⁶ S.L.A. Marshall, *Men Against Fire: The Problem of Battle Command in Future War*, (Gloucester, MA: Peter Smith, 1978), 42.
- ¹⁷ Griffith, 182-3.
- ¹⁸ TRADOC Pamphlet 525-5, 3-21.
- ¹⁹ John Arquette and David Ronfelt, "Cyberwar Is Coming!" *Comparative Strategy*, v12, no 2, (1993): 141.
- ²⁰ van Creveld, 265-6.
- ²¹ Peter Coveney and Roger Highfield, *Frontiers of Complexity*, (New York: Fawcett Columbine, 1995), 338.
- ²² van Creveld, 3.
- ²³ Ibid., 3.
- ²⁴ Ibid., 267.
- ²⁵ Carl von Clausewitz, *On War*, ed. and trans. by Michael Howard and Peter Paret, (Princeton, NJ: Princeton University Press, 1976), 117.
- ²⁶ Daniel P. Bolger, *Savage Peace: Americans at War in the 1990s*, (Novato, CA: Presidio Press, 1995), 97.
- ²⁷ Christopher Bellamy, *The Future of Land Warfare*, (New York: St. Martin's Press, 1987), 244.

3. ²⁸ John W. Foss, "Command," *Military Review*, vLXX, no. 5 (May 1990):

²⁹ Department of the Navy, *Naval Doctrine Publication 6: Naval Command and Control*, (Washington, D.C.: Department of the Navy, 19 May 1995), 13.

³⁰ Ibid., 13.

³¹ Leonhard, 3-4.

³² Sullivan, 12.

³³ Leonhard, 7-8.

³⁴ TRADOC Pamphlet 525-5, 2-7.

³⁵ Ibid., 2-5.

³⁶ Ralph Peters, "The Culture of Future Conflict," *Parameters* vXXV, no. 4, (Winter 1995-96): 26.

³⁷ Leonhard, 87.

³⁸ Ibid., 88.

³⁹ Bolger, 98.

⁴⁰ TRADOC Pamphlet 525-5, i.

⁴¹ Ibid., 3-3.

⁴² Ibid., 3-19.

⁴³ Ibid., 3-4.

⁴⁴ Ibid., 3-5.

⁴⁵ Ibid., Glossary-7.

⁴⁶ Brigadier General Wass De Czege, USA (ret.), has used the chessboard example in some of his speeches. The author heard of the analogy from other officers in his seminar.

⁴⁷ David Jablonsky, "US Military Doctrine and the Revolution in Military Affairs", *Parameters*, vXXIV, no. 3, (Autumn 1994): 28.

⁴⁸ van Creveld, 255.

⁴⁹ Ibid., 255-6.

⁵⁰ Foss, 6.

⁵¹ Richard E. Simpkin, "Command From the Bottom Up," *Infantry*, v75, (March/April 1985): 36.

⁵² Department of the Army, *FM 100-6 Information Operations*, (Washington, D.C.: Department of the Army, August 1996), 2-1.

⁵³ Naval Doctrine Publication 6, 22.

⁵⁴ Ibid., 22.

⁵⁵ James J. Schneider, *The Theory of Operational Art*, Theoretical Paper No. 3, 2d revision, (Fort Leavenworth, KS: School of Advanced Military Studies, 1 March 1988), 49.

⁵⁶ Naval Doctrine Publication 6, 23.

⁵⁷ As presented in FM 100-6, figure 2-1. Also shown in Naval Doctrine Publication 6, figure 2-2.

⁵⁸ James C. Madigan and George E. Dodge, "Battle Command: A Force XXI Imperative," *Military Review*, vLXXIV, no. 11 (November 1994): 36.

⁵⁹ We know the distances from (c) to (d) to be 150 meters and from (d) to point B to be 200 meters. Using Pythagorean's theorem, $c^2 = a^2 + b^2$, $c = 250$ meters. Knowing that the tangent of theta equals the opposite side divided by the adjacent side, the tangent of theta of the angle at (c) equals 200 divided by 150, equaling 1.33333. Theta, the angle, equals 53.13 degrees. Rounding produces 53 degrees.

⁶⁰ Department of the Army, *FM 100-5 Operations*, (Washington, D.C.: Department of the Army, 1993), 6-6.

⁶¹ James M. Dubik, "On Initiative and Control," *Marine Corps Gazette*, v77, no. 4, (April 1993): 75

⁶² Ibid., 81.

⁶³ FM 100-5, 2-5.

⁶⁴ William E. Depuy, "Concepts of Operation: The Heart of Command, The Tool of Doctrine," *Army*, v38, no. 8, (August 1988): 31.

⁶⁵ James B. Burton, *The Decisive Point: Identifying Points of Leverage in Tactical Combat Operations*, (Fort Leavenworth, KS: School of Advanced Military Studies, 14 December 1995), 36.

⁶⁶ As quoted in Depuy, 37, 40.

⁶⁷ Center for Army Tactics, *C310 Course Syllabus Fundamentals of Combat Operations*, (Fort Leavenworth, KS: United States Army Command and General Staff College, August 1995), 260.

⁶⁸ Depuy, 37.

⁶⁹ The division's mission statement listed the purpose as establishing conditions for the corps counteroffensive. This purpose is vague. In order to focus the brigades' efforts, the division commander should choose a clearer purpose for his subordinates to attain. 2d BDE's purpose in the alternative concept of operations was kept the same as the division's purpose to illustrate the nesting of the brigade's purpose back to division. In reality, the brigade commander, given this purpose, would need to provide a more precise purpose to his subordinates.

⁷⁰ Department of the Army, *FM 71-100 Division Operations*, (Washington, D.C.: Department of the Army, June 1990), 4-7.

⁷¹ Depuy, 31.

⁷² James P. Kahan, D. Robert Worley, and Cathleen Stasz, *Understanding Commanders' Information Needs*, (Santa Monica, CA: The RAND Corporation, June 1989), vi.

⁷³ Leonhard, 178.

⁷⁴ Sullivan, 15.

⁷⁵ TRADOC Pamphlet 525-5, 3-8.

⁷⁶ Depuy, 31.

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